

Market Approaches for Ecosystem Services: Example of Grassland Nesting Birds on Hayfields

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Conservation Innovation Grant

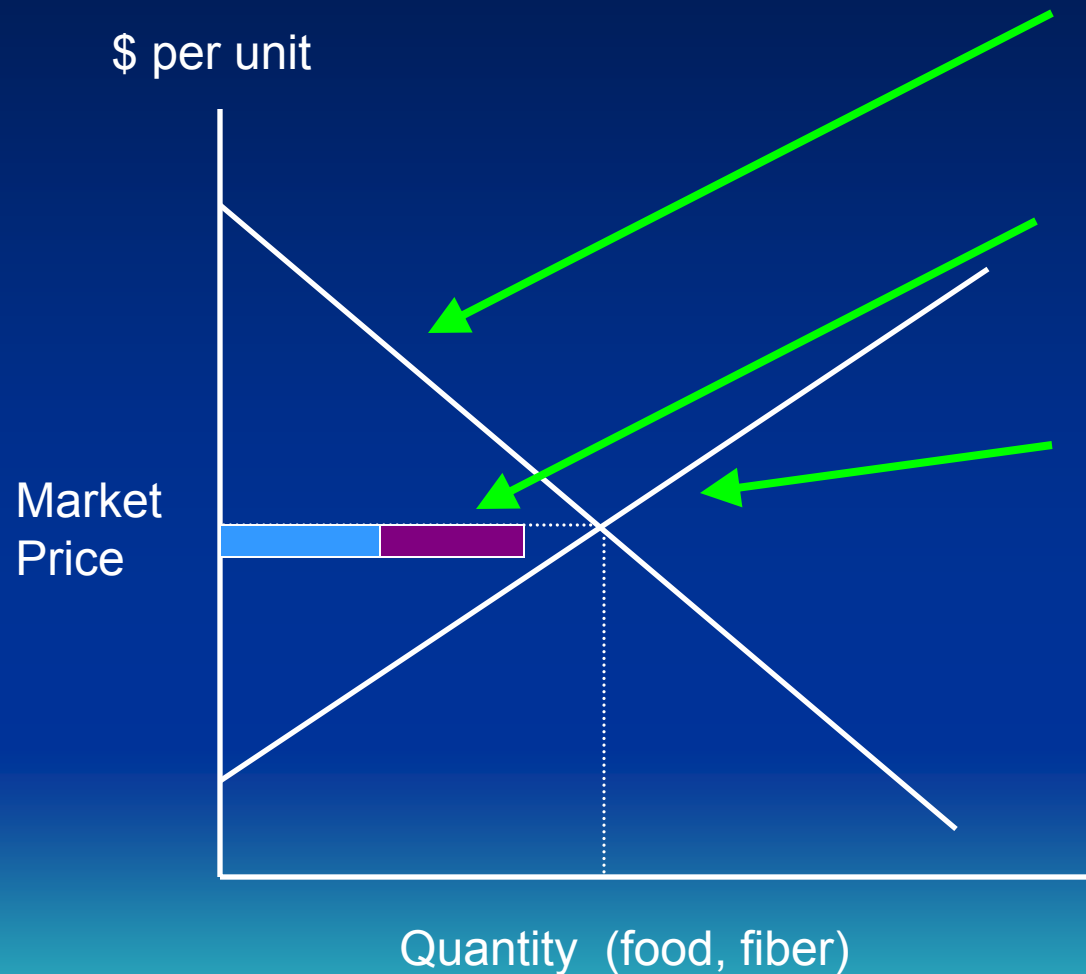


Overview

- Quick demand-supply reminder (private goods)
- Review problem of public goods
 - Failure of market prices to form
- Describe experimental market for grassland birds
 - incentives tested; revenues
- Describe potential new business process (patent pending)

Market Goods – Private, Exclusion

Consumers value first few units (to eat) highly, but value next units less highly.



Excludability in consumption: Only one consumer can use each unit.

Supply – starts with some cost of production, rising as more is produced.

Law of one Price – all pay same, and providers get incentive to provide because markets form

Public Goods – non-excludable, benefit many people simultaneously

\$ per unit

Single person values water quality initially high,
with declining value.

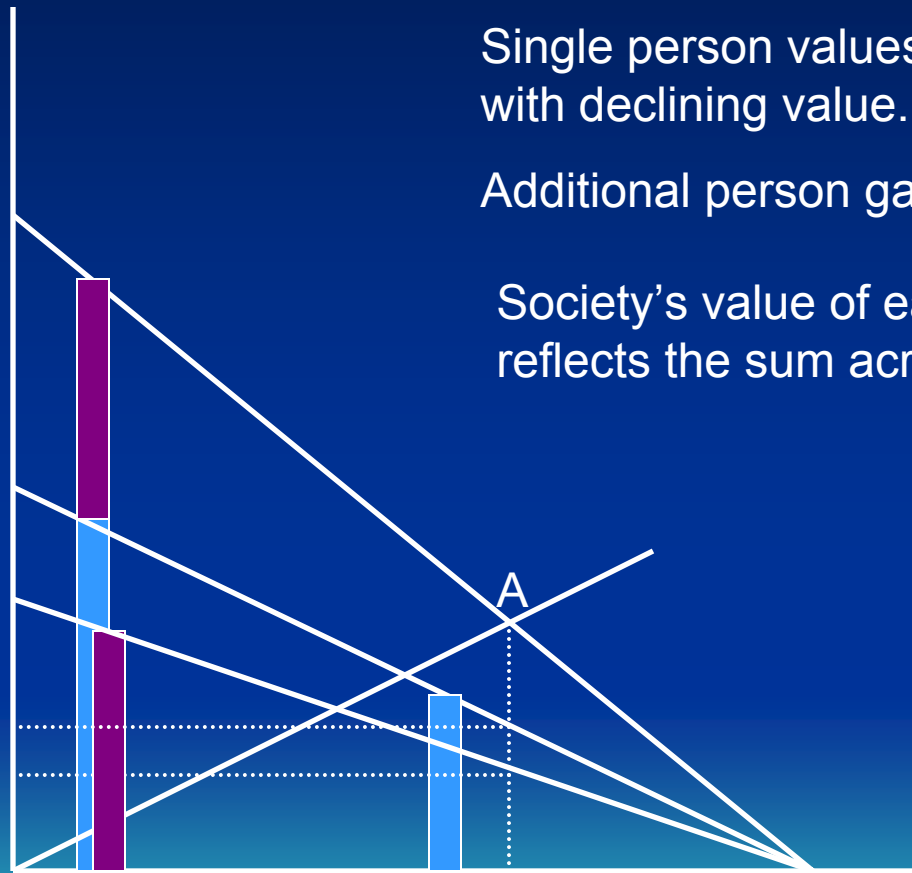
Additional person gains value from same units.

Society's value of each increment in service
reflects the sum across individuals.

If one person pays for a unit,
others still benefit. People
can “ride free” on providers.

Balance benefits and
costs using
individualized prices.

Individualized
Prices, Value



Quantity (e.g., environmental restoration)

The Public Good Challenge

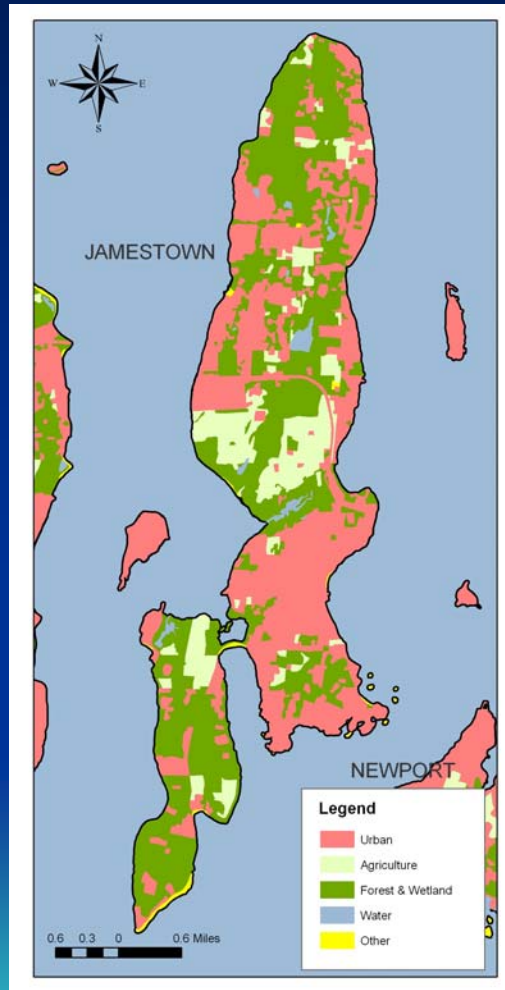
- Ecosystem Services often Public Goods
 - Cultural or aesthetic ecosystem services (open space, bird watching – affecting livable communities)
 - Some supporting services (habitat)
 - Some regulating services (climate mitigation)
 - Some provisioning services (watershed supply)
- “Free ride” or “cheap ride”
relative to personal benefit
- Result: limited business potential despite value



Adding a Third Rail to Available Approaches

- Government's authority to regulate, including cap and trade or payments
 - Admin costs; attenuation of consumer values
- Philanthropy establishing broad projects
 - Free riding costs; dissipate consumer values
- Market approach
 - Integrate consumer/beneficiary values directly
 - **Critical need:** rules of exchange that reduce free riding, enable providers to benefit

Selling Farm Ecosystem Services



- For-profit farm product
 - Grassland bird habitat
 - Bobolinks on hayfields
 - Farm contract
 - Sell share to residents
- Pay farmers to compensate for feed and management to protect nesting birds



Why residents buy bobolinks?

1. Generally value wildlife and ecosystem health in rural town
2. Product encourages farm hayfields = pastoral views
3. Sustain active farm heritage

Potential Umbrella Bundle:

4. Restoration from idle fields = remove invasive species, adds views (butterfly connection)
5. Potential water quality/quantity links relative to alternative crops

Visible bird

Species in decline

Acrobatic call display

R-2-D-2

Experimental Market

- A deliverable public good
 - Late May to early July:
 - Hay at peak nutritional value
 - Bobolinks / grassland birds nesting
- Identifiable beneficiaries:
 - Ex-urban residents value landscape and wildlife or ecosystem health





0 110 220 440 660 880 Meters

Watson Farm Bobolinks

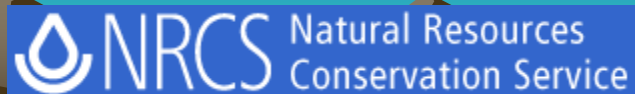
- May 21, 2007
- May 31, 2007
- June 8, 2007
- June 24, 2007
- July 2, 2007
- ▭ Contract Field
- ▭ Survey Fields

Carol Lynn Trocki, 9/2008
Base Layer: 1:12,000 scale
Aug 2006 orthophotograph,
0.5m pixel resolution
(URI-EDC)



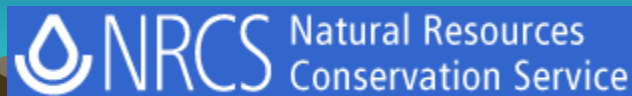
All Test Mechanisms

- Group of potential beneficiaries – Exurban residents
- Money back guarantee (MBG)
- Establish “Provision Point” = Farm Contract Cost = minimum target for funds
- Provision Point + MBG = threat of non-provision



Mechanism 1: Proportional Rebate (PR)

- Individual: pledge to maximum payment
 - Pay only proportion needed for provision point
- Example: Person pledges \$50 and all pledges total \$5000 but contract cost is \$2500 --- then person only pays \$25
 - *Incentives reduce cost of pledging beyond marginal need*



Mechanism 2: Uniform Price Auction (UPA)

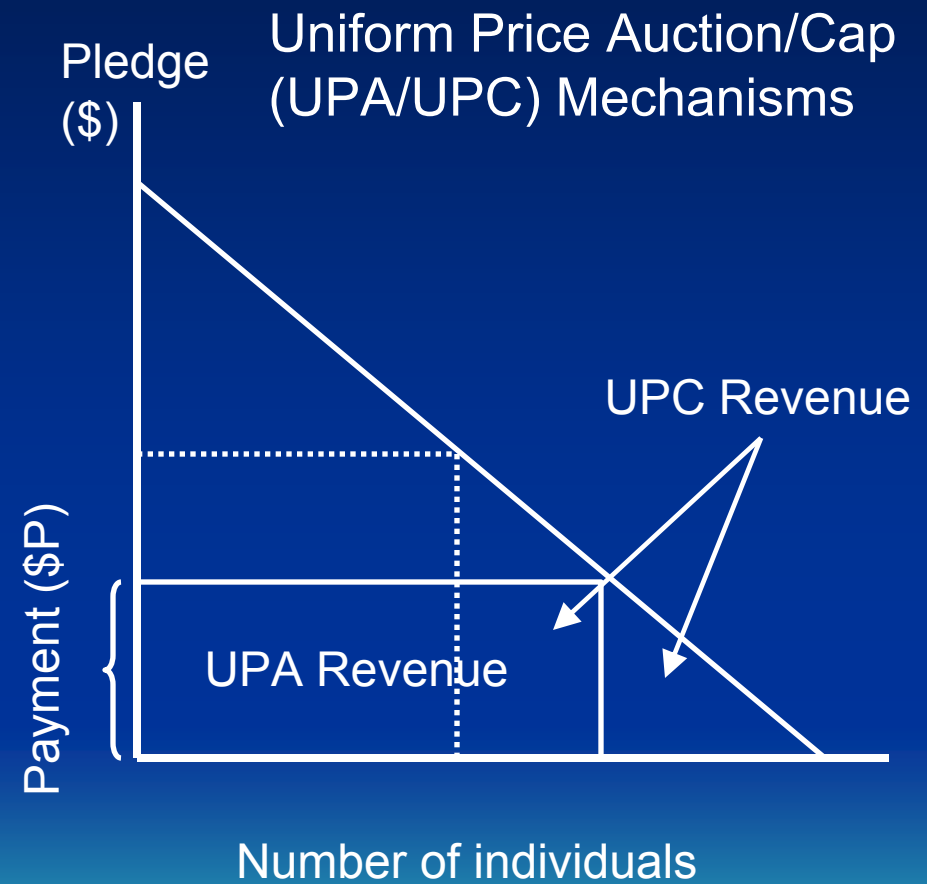
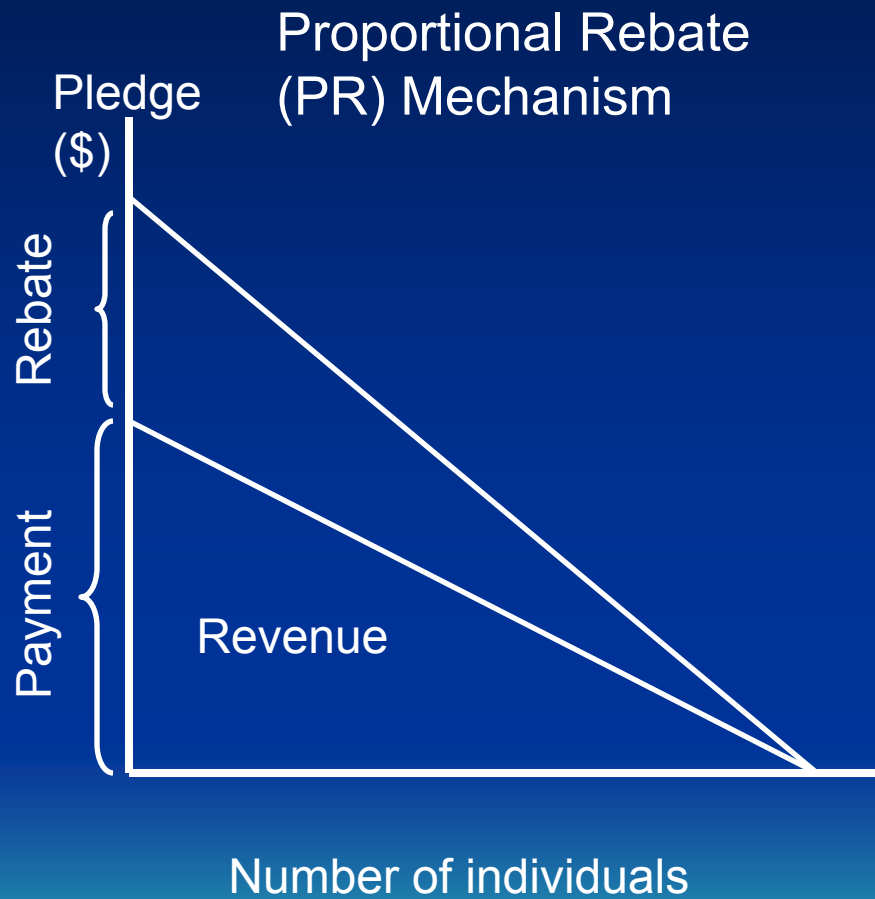
- Pledge to maximum payment
 - Broker calculates a uniform-price $\$P$ to meet the Provision Point (contract cost)
 - Pledged $>\$P$? Pay uniform price $\$P$
 - Pledged $\leq \$P$? Pay nothing
- Incentives create more separation between pledge and final payment
 - Fair? All payers pay the same “uniform price”



Mechanism 3: Uniform Price Cap (UPC)

- Modification of UPA
- Broker still calculates $\$P$ —a Price-Cap—to meet the Provision Point
 - Pledged $>\$P$? Pay $\$P$ Price-cap
 - Pledged $\leq \$P$? Pay amount pledged/offered
- Address part of reaction to rebates/refunds
- If PR provides, UPC provides too

Set revenue = Provision Point or implement money-back-guarantee



Mechanism 4: Pivotal Mechanism (PM)

- Incentive compatible
- Designed to measure value (check efficiency)
- Each person makes offer $\$x_i$
- Pay if “pivotal” – if your $\$X_i$ just makes total reach provision point:
 - Pay $\$X_i$ if $\sum X_{\neq i} < PP < \sum X_{\neq i} + X_i$
 - Pay \$0 otherwise





HAYFIELD with Female and Male Bobolink

BOBOLINK PROTECTION

Last week, the Nature Services Exchange signed contracts with several local farmers for Bobolink protection during the spring and early summer nesting season.

In the next few weeks, we will open a Jamestown exchange so that you will have the opportunity to purchase a share of a farm wildlife contract. Your participation will help farmers incorporate wildlife protection in their farm management plan and maintain Jamestown's rural and agricultural landscape.

Watch your mail on March 6th for an opportunity to invest in Jamestown's farm



Nature Services Exchange of Jamestown

Linking Communities to Nature through Market Innovation

A Partnership between EcoAsset Markets, Inc. and the University of Rhode Island

Newspaper Advertisement



JAMESTOWN FARM and the Bay

Nature Services Exchange is now open

The presence of successful, breeding bobolinks reflects a grassland ecosystem that is suitable habitat for other birds as well. Savannah Sparrows also nest in hayfields. Glossy Ibis, Cattle Egrets and Red-Tailed Hawks make use of open habitats and grazing lands.

Farm-wildlife contracts create a new service from hayfields, making hay for habitat a product for the farmer.

By enhancing the economic viability of working farms, these contracts help prevent hayfields from reverting to brush and attracting invasive species.

This new exchange between your community and Jamestown farmers could encourage them to create more hayfields for residents to enjoy.

In this week's mail you will receive an opportunity to invest in Jamestown's farms

Trademark

Web Site



NATURE SERVICES EXCHANGE OF JAMESTOWN

[Who Are We?](#)[FAQ](#)[Results So Far](#)[Contact Us](#)

Their Home. Your Hometown.

Bobolinks are part of Jamestown's Heritage

Each spring, Bobolinks leave their wintering grounds in South America and fly 5,000 miles to build their nests in hayfields across North America. Bobolinks have been migrating to Jamestown's farms for centuries and were once considered Rhode Island's most common bird.

The Bobolink population in the Northeast has declined nearly 40% over the past 25 years as their habitat has disappeared and farming techniques have changed. Today's hay harvest now coincides with Bobolinks' nesting season. As a result, nests are often destroyed before the chicks have hatched and flown away.

The Bobolink has been designated a "priority species" for Northeastern grassland habitats by Partners in Flight, an international coalition devoted to bird conservation.

An Innovative Solution

Bobolinks need hayfields. Farmers need a harvest. The Nature Services Exchange brings the two together by creating a new "service" that farmers can sell: providing bird habitat.

Here Is How It Works

Jamestown residents pay into a fund, which in turn pays farmers who sign a farm-wildlife contract. Under these yearly contracts, farmers agree to refrain from mowing and to limit cattle grazing during Bobolink nesting season, and are compensated for costs of feed and changes in their operations.

How Does Participating Benefit You?

You are joining with your neighbors to protect the Bobolink, as well as other birds and wildlife that live and breed in managed hayfields. You also are maintaining the character of Jamestown by helping its preserved farms remain working farms.



ABOUT BOBOLINKS

Scientific Name: *Dolichonyx oryzivorus*

Nicknames: White-winged blackbird, butter bird, rice bird, reed bird

Size: About 7 inches

FUN FACTS

Bobolinks' bubbling, ebullient song has inspired poets such as Emily Dickinson and William Cullen Bryant.

The Bobolink has the longest migration of any North American songbird, spending the winter months in the pampas (native grasslands) of Brazil and Argentina and summering as far north as Canada.

© 2007 Nature Services Exchange of Jamestown

Brochure for Direct Mail Marketing

About Bobolinks

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Bobolink adults often cooperate to feed nestlings. The "helpers" may be offspring from a previous year, or other adults that have lost their brood.

In New England, Bobolinks are particular about nesting in managed hayfields. Their presence indicates suitable habitat for Savannah Sparrows and other grassland species.

A group of Bobolinks is called a chain.

What is the Nature Services Exchange?

The Nature Services Exchange of Jamestown is a partnership between the University of Rhode Island and EcoAsset Markets Inc., a Providence-based company that works to encourage market-based conservation solutions. The project is funded by the U.S. Department of Agriculture through a Conservation Innovation Grant from the Natural Resource Conservation Service, with matching funds from URI and EcoAsset Markets Inc.

The Nature Services Exchange of Jamestown is a pilot project that could create a new national model for market-based wildlife conservation.

Nature Services Exchange of Jamestown

Stephen Swallow: swallow@uri.edu or 401.874.4589

Emi Uchida: emiguri@uri.edu or 401.874.4586

www.jamestownbobolinkproject.com



Their home. Your hometown.

Jamestown, R.I.

Offer to recipient:

Field description

Mechanism
described

(UPC version)

Discrete Choice (yes-no)

(Open-ended
modified “payment card”)

Credit Card
authorization or
personal check



The Nature Services Exchange is offering you the opportunity to help protect a Jamestown hayfield of about 10 acres that can be seen from a public road, and which has had at least one bobolink territory in the last two years. One territory can support up to 15-Apr fledglings. Under the annual farm-wildlife contracts, farmers agree to refrain from mowing and to limit cattle grazing from May 7 to July 4. In return, farmers are compensated for the costs of maintaining the Bobolink habitat this year.

We have divided Jamestown into several groups of residents. Help protect your group's Bobolink habitat by signing the payment card below. Because it is a cooperative effort, your support is critical. We have structured our program in an unusual way to ensure that we collect only as much money as we need to protect Bobolink habitat.

We are asking for your money now, but we will use it *only if necessary*. That is:

- We are asking everyone in your community group to contribute to a dedicated fund to buy a farm-wildlife contract for the 2008 Bobolink nesting season.
- On April 30, if the fund contains sufficient money, we will buy the farm-wildlife contract.
- We will return any leftover money as follows. We will look for the lowest contribution that we can set as a "contribution cap" and still buy the contract. If your contribution was above this cap, we will return to you the amount you contributed above the cap. If the fund does not contain enough to pay for the contract, then we will return all money collected and the hayfield will not be managed for Bobolinks this year.

This approach is designed to bring many people to participate at the same time, which means costs to you and each Jamestown resident in your group will be kept low. Your payment will help farmers to cover their extra costs to feed their animals and extra labor to run their operations, while they do better for nature in your hometown.

All offers must be received at URI **no later than April 30** to ensure that farmers can implement contracts in time for breeding of bobolinks and other wildlife. Even if you do not want to make an offer, please check the box marked "No" and return the form in the enclosed envelope.

We appreciate your investment in protecting Jamestown's Bobolinks. Please watch for our invitation to participants later this spring to join us on a walk through Bobolink habitat. In May we will send you a progress report and a web site to look up what we see in your group's field for 2008.

Michael Abbood
5 Middle St
Jamestown, RI 02835
(If you prefer a different address, please correct above.)

Would you agree to pay up to \$10 to maintain a hayfield for Bobolinks this year?

- ☐ Yes, the University of Rhode Island is authorized to charge my credit card (below) up to \$10.
- ☐ Yes, I have enclosed a check payable to the University of Rhode Island for \$10.
- ☐ No. Thank you, but I do not wish to participate at this time.

Credit card information: ☐ Visa ☐ Mastercard ☐ American Express

Name on Card: _____ Card #: _____ Exp. Date: _____

Signature: _____

Billing address (if different from above): _____

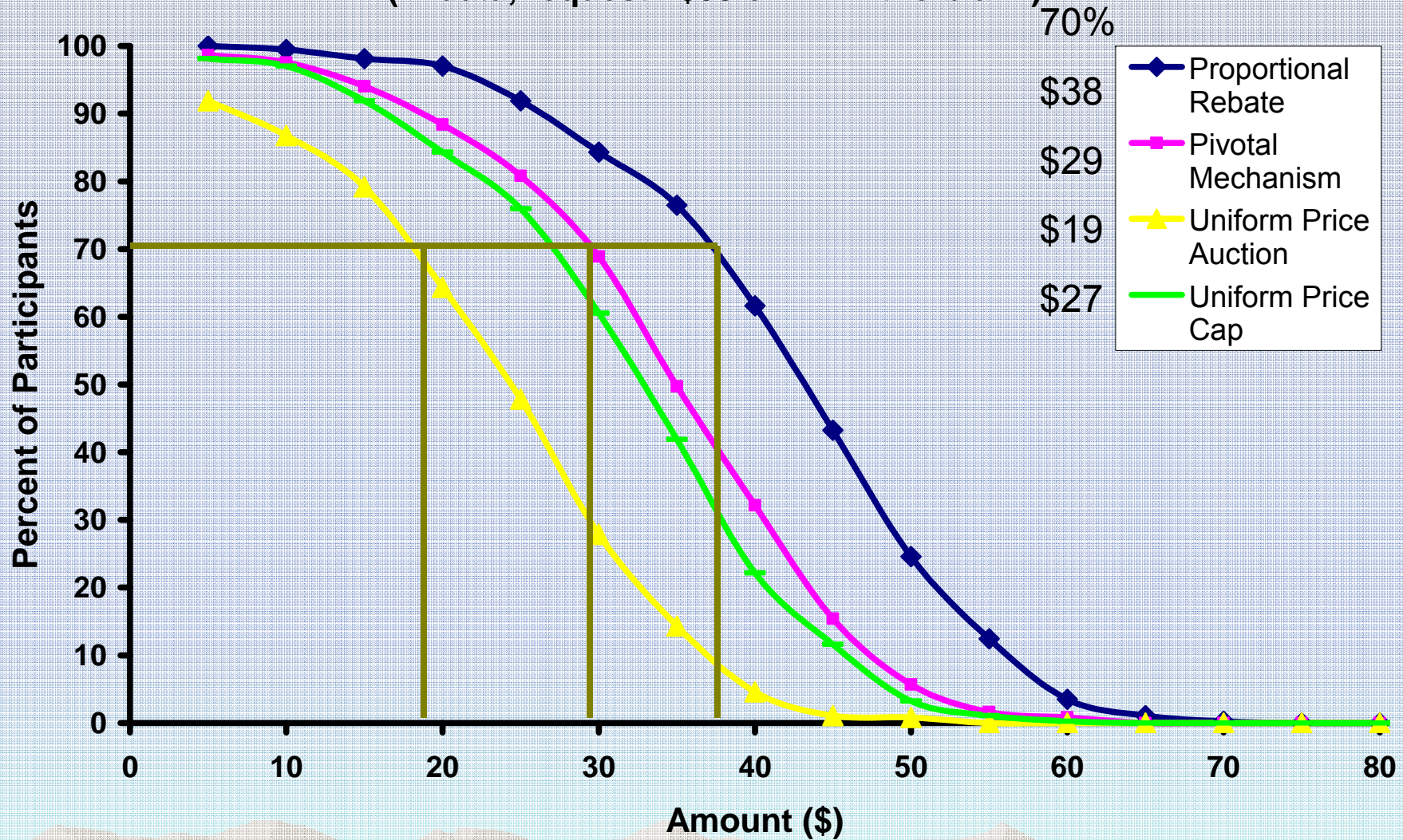
Implementation – Response

- March-April (07-08)- 2 mailings + reminder
- About 2750 deliverable homes
 - 2007: 371 respond, 189 offers = \$9700
 - 2008: 212 respond, 143 offers = \$6800

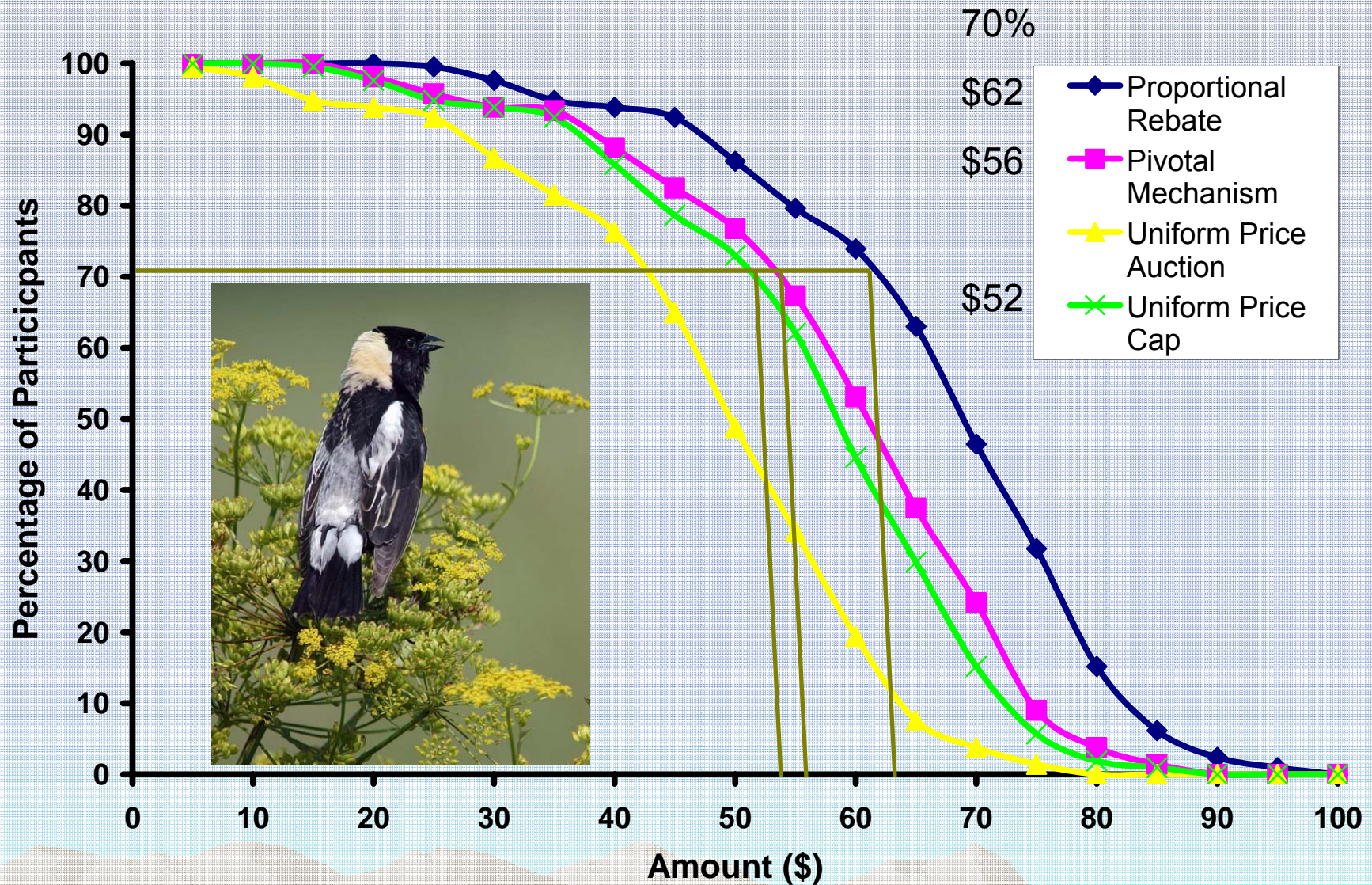
Participation Insights

- More likely to respond if:
 - Previous donor to various charity
 - Higher income (or didn't tell income)
- 2007 Participation more likely than 2008
- Made no difference:
 - Attributes of bobolink parcels
 - Rules-of-trade except:
- Lower minimum \$ amount increased participation

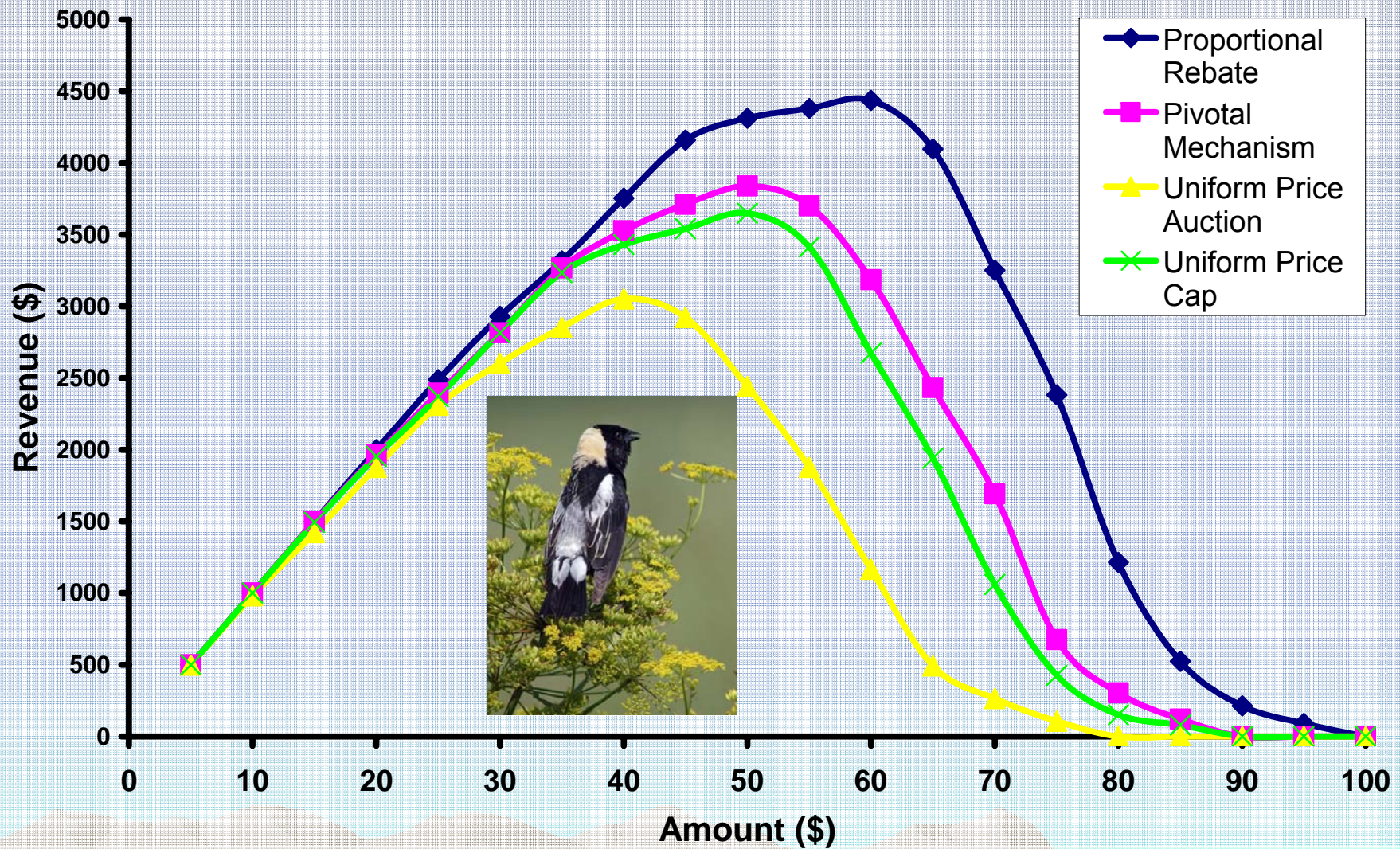
Percent of 2007 Participants with WTP > Amount, in Open-Ended High
(In data, request >\$35 or fill-in-the-blank)



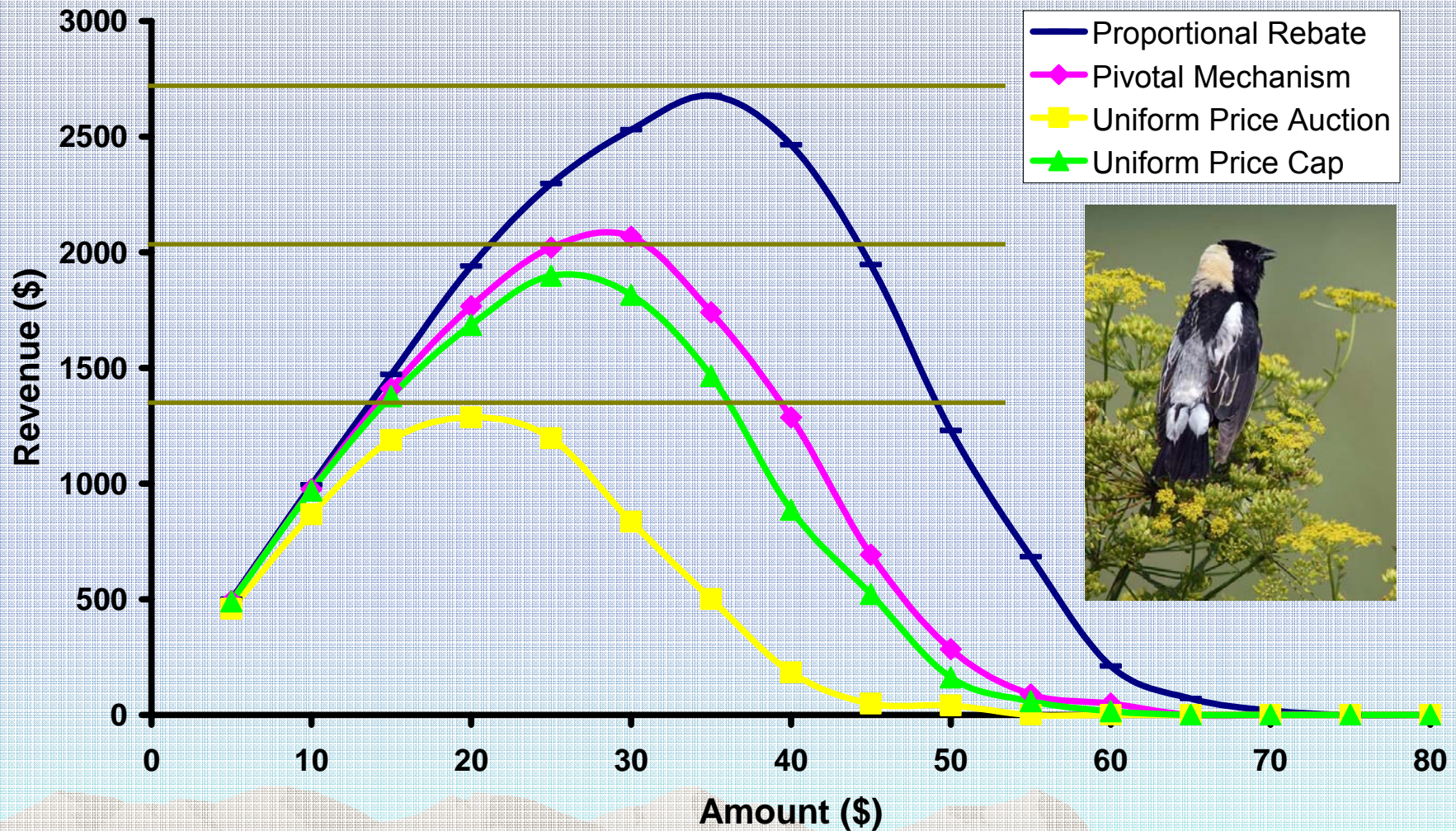
Percentage of 2008 Participants WTP > Amount, in Discrete Choice



Projected 2008 Revenue per 100 Participants in 2008, with Discrete Choice



Projected 2007 Revenue per 100 Participants, in Open-Ended High
(In data, requested \$35 or more or fill-in-the-blank)



Discussion: Research Agenda

- Long-run performance concerns
 - Will offers degrade toward free-riding over time?
- Public frame of reference
 - Use of excess funds: Extra field, second field
- Guide public investment in conservation
- Challenge of Fluid, arms-length market
 - Identifying individualized prices
- Bundling multiple ecosystem services

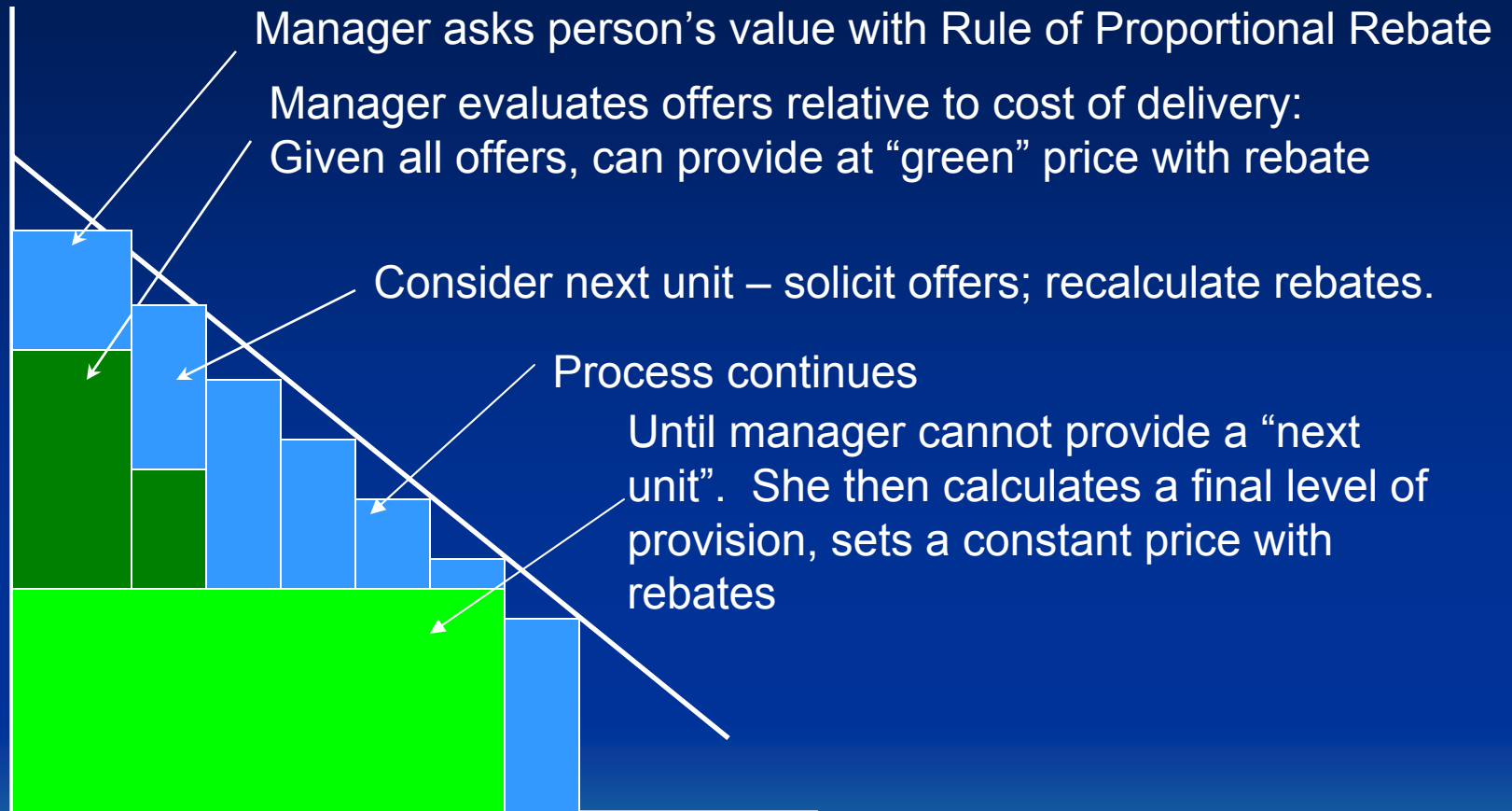


Production Ecology

- Production of ecosystem services
 - Ability to attract bobolinks via audio calls (behavioral ecology)
 - Rotations for birds and hayfield quality (farmer concerns)
 - Restoration of idle fields
- How will market affect ecosystem services in long term, with what side effects?
 - Carbon farming versus habitat diversity and landscape aesthetics

New Business Process (patent pending): – soliciting bids for individualized prices

Person's value
(\$/unit)



Restoration Units (to be provided)

From Elizabeth C. Smith,
Stephen K. Swallow
NSF LTER at VCR site.